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☐ 1. Document ID: US 6865582 B2

L27: Entry 1 of 8

File: USPT

Mar 8, 2005

DOCUMENT-IDENTIFIER: US 6865582 B2

TITLE: Systems and methods for knowledge discovery in spatial data

Abstract Text (1):

Systems and methods are provided for knowledge discovery in spatial data as well as to systems and methods for optimizing recipes used in spatial environments such as may be found in precision agriculture. A spatial data analysis and modeling module is provided which allows users to interactively and flexibly analyze and mine spatial data. The spatial data analysis and modeling module applies data mining algorithms through a number of steps. The data loading and generation module obtains or generates spatial data and allows for basic partitioning. The inspection module provides basic statistical analysis. The preprocessing module smoothes and cleans the data and allows for basic manipulation of the data. The partitioning module provides for more advanced data partitioning. The prediction module applies regression and classification algorithms on the spatial data. The integration module enhances prediction methods by combining and integrating models. The recommendation module provides the user with site-specific recommendations as to how to optimize a recipe for a spatial environment such as a fertilizer recipe for an agricultural field:

Detailed Description Text (73):

The recommendation module 222 may provide different types of information. For example, the recommendation module 222 could be converted into a fertilizer module, meaning that the parameter that is evaluated is how much fertilizer should be applied to each point based on the spatial data analysis. Or the recommendation module could be converted into an irrigation module which would evaluate how much to irrigate the field at predetermined points. Other examples include pesticide module, herbicide module, seed-variety spacing module, and the like.

Current US Original Classification (1):

707/104.1

Current US Cross Reference Classification (1):

707/10

Full	Title	Citation	Front	Review	Classification	Date	Reference	<a href="#">Sequences</a>	<a href="#">Attachments</a>	Claims	KWIC	Draw D
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☐ 2. Document ID: US 6836773 B2

L27: Entry 2 of 8

File: USPT

Dec 28, 2004

h e b b g e e e f e ef b e

DOCUMENT-IDENTIFIER: US 6836773 B2

TITLE: Enterprise web mining system and method

Abstract Text (1):

An enterprise-wide web data mining system, computer program product, and method of operation thereof, that uses Internet based data sources, and which operates in an automated and cost effective manner. The enterprise web mining system comprises: a database coupled to a plurality of data sources, the database operable to store data collected from the data sources; a data mining engine coupled to the web server and the database, the data mining engine operable to generate a plurality of data mining models using the collected data; a server coupled to a network, the server operable to: receive a request for a prediction or recommendation over the network, generate a prediction or recommendation using the data mining models, and transmit the generated prediction or recommendation.

Detailed Description Text (51):

Data preprocessing engine 903 provides the extraction and transformation components, which extract data from web logs and other corporate information sources and transform it into a form suitable for data mining model construction. There are several main sub-components of data preprocessing engine 903. The mapping and selection component reads corporate database tables, such as those from corporate data sources 914, and maps specific fields into the account-based mining tables. The web data transformation component reads raw log files, and optionally transaction summaries, from external data sources 916, and converts them into the transaction-based mining schema (TBMS) used by present invention. The web data transformation component also performs semantic analysis and keyword extraction on the original and converted web data to produce conceptual tables, concept-based mining schema (CBMS).

Current US Original Classification (1):

707/6

CLAIMS:

1. A computer-implemented method of enterprise web mining comprising the steps of: collecting data from a plurality of data sources, including proprietary corporate data comprising proprietary account or user-based data, external data comprising data acquired from sources external to the system, Web data comprising Web traffic data, web server application program interface data and Web server log data, and Web transaction data comprising data relating to transactions completed over the Web; selecting data that is relevant to a desired output from among the collected data by mapping between general attributes and particular features, the selected data having reduced dimensionality relative to the collected data; pre-processing the selected data by removing redundant or irrelevant information from Web server log data, by identifying a visitor to a web site from the Web traffic data, reconstructing a session from the Web traffic data, by reconstructing a path followed by a visitor in a session from the Web server log data, by analyzing a path a whole Website from the Web server log data, by converting to filenames from the Web server log data to page titles, and by converting IP addresses from the Web traffic data to domain names; building a plurality of database tables from the pre-processed selected data, wherein the acquired data comprises a plurality of different types of data; integrating the collected data by forming an integrated database comprising collected data in a coherent format using generated taxonomies to group attributes of the data and using generated profiles of the data; generating a plurality of data mining models using the collected data; and generating a prediction or recommendation using at least one of the plurality of generated data mining models, in response to a received request for a recommendation or prediction.

6. A computer program product for performing an enterprise web mining process in an electronic data processing system, comprising: a computer readable medium; computer program instructions, recorded on the computer readable medium, executable by a processor, for performing the steps of: collecting data from a plurality of data sources, including proprietary corporate data comprising proprietary account or user-based data, external data comprising data acquired from sources external to the system, Web data comprising Web traffic data, web server application program interface data and Web server log data, and Web transaction data comprising data relating to transactions completed over the Web; selecting data that is relevant to a desired output from among the collected data by mapping between general attributes and particular features, the selected data having reduced dimensionality relative to the collected data; pre-processing the selected data by removing redundant or irrelevant information from Web server log data, by identifying a visitor to a web site from the Web traffic data, reconstructing a session from the Web traffic data, by reconstructing a path followed by a visitor in a session from the Web server log data, by analyzing a path a whole Website from the Web server log data, by converting to filenames from the Web server log data to page titles, and by converting IP addresses from the Web traffic data to domain names; building a plurality of database tables from the pre-processed selected data, wherein the acquired data comprises a plurality of different types of data; integrating the collected data by forming an integrated database comprising collected data in a coherent format using generated taxonomies to group attributes of the data and using generated profiles of the data; generating a plurality of data mining models using the collected data; and generating a prediction or recommendation using at least one of the plurality of generated data mining models, in response to a received request for a recommendation or prediction.

11. A system for performing an enterprise web mining process, comprising: a processor operable to execute computer program instructions; and a memory operable to store computer program instructions executable by the processor, for performing the steps of: collecting data from a plurality of data sources, including proprietary corporate data comprising proprietary account or user-based data, external data comprising data acquired from sources external to the system, Web data comprising Web traffic data, web server application program interface data and Web server log data, and Web transaction data comprising data relating to transactions completed over the Web; selecting data that is relevant to a desired output from among the collected data by mapping between general attributes and particular features, the selected data having reduced dimensionality relative to the collected data; pre-processing the selected data by removing redundant or irrelevant information from Web server log data, by identifying a visitor to a web site from the Web traffic data, reconstructing a session from the Web traffic data, by reconstructing a path followed by a visitor in a session from the Web server log data, by analyzing a path a whole Website from the Web server log data, by converting to filenames from the Web server log data to page titles, and by converting IP addresses from the Web traffic data to domain names; building a plurality of database tables from the pre-processed selected data, wherein the acquired data comprises a plurality of different types of data; integrating the collected data by forming an integrated database comprising collected data in a coherent format using generated taxonomies to group attributes of the data and using generated profiles of the data; generating a plurality of data mining models using the collected data; and generating a prediction or recommendation using at least one of the plurality of generated data mining models, in response to a received request for a recommendation or prediction.

16. An enterprise web mining system comprising: a database system coupled to a plurality of data sources, the database system operable to store data collected from the data sources, the data sources including proprietary corporate data comprising proprietary account or user-based data, external data comprising data acquired from sources external to the system, Web data comprising Web traffic data,

web server application program interface data and Web server log data, and Web transaction data comprising data relating to transactions completed over the Web, the database further operable to select data that is relevant to a desired output from among the collected data by mapping between general attributes and particular features, the selected data having reduced dimensionality relative to the collected data, the database further operable to pre-process the selected data by removing redundant or irrelevant information from Web server log data, by identifying a visitor to a web site from the Web traffic data, reconstructing a session from the Web traffic data, by reconstructing a path followed by a visitor in a session from the Web server log data, by analyzing a path a whole Website from the Web server log data, by converting to filenames from the Web server Jog data to page titles, and by converting IP addresses from the Web traffic data to domain names, the database further operable to build a plurality of database tables from the pre-processed selected data, wherein the acquired data comprises a plurality of different types of data, and the database further operable to integrate the collected data by forming an integrated database comprising collected data in a coherent format using generated taxonomies to group attributes of the data and using generated profiles of the data; a data mining engine coupled to the database, the data mining engine operable to generate a plurality of data mining models using the integrated database; a server coupled to a network, the server operable to receive a request for a prediction or recommendation over the network, generate a prediction or recommendation using at least one of the data mining models, and transmit the generated prediction or recommendation.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMNC	Draw De
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☐ 3. Document ID: US 6745185 B2

L27: Entry 3 of 8

File: USPT

Jun 1, 2004

DOCUMENT-IDENTIFIER: US 6745185 B2

TITLE: System and method for online agency service of data mining and analyzing

Abstract Text (1):

A system and method for an online agency service of data mining and analyzing is disclosed. The system and method can automatically fetch and analyze data stored in a remote source database (10) based on a data analysis request originating from a client site (3). Initially, the client site (3) sends a data analysis request to the service provider (2). The service provider (2) converts the data analysis request into a standard format of query information, and searches the source database (10). A plurality of data records are searched and written into a local database (23) contained in the service provider (2). Finally, the service provider (2) analyzes the data stored in the local database, and generates a search report which is then sent to the client site (3).

Detailed Description Text (9):

Referring to FIG. 2, a system for an online agency service of data mining and analyzing (herein simplified as the agency service system) is shown. The agency service system comprises a source database 10 which may be linked to a Web site, a service provider 2, and a client site 3. A local database 23 is installed in the site of the service provider 2 for storing data extracted from the source database 10. The service provider 2 herein is a server which contains executable software stored therein. A service procedure of the agency service system may be separated

into the following steps: (1) The client site 3 sends a data-analysis request to the service provider 2. (2) The service provider 2 converts the data analysis request into a standard format of query information. (3) The service provider 2 sends the standard format of query information to the source database 10. (4) A searching engine attached to the source database 10 performs a data search and obtains a plurality of records of source data meeting the standard format of query information. (5) The service provider 2 performs extraction and classification on the obtained source data and downloads the extracted data to related columns of the local database 23. (6) The service provider 2 performs analysis on the data stored in the local database 23 and obtains an analysis report. (7) The service provider 2 sends the analysis report to the client site 3 and charges the client site 3.

Current US Original Classification (1):

707/6

Current US Cross Reference Classification (1):

707/10

Current US Cross Reference Classification (2):

707/101

Current US Cross Reference Classification (3):

707/3

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw De
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☐ 4. Document ID: US 6718338 B2

L27: Entry 4 of 8

File: USPT

Apr 6, 2004

DOCUMENT-IDENTIFIER: US 6718338 B2

TITLE: Storing data mining clustering results in a relational database for querying and reporting

Abstract Text (1):

Storing data mining clustering results in a relational database for querying and reporting, including reading, from a hierarchical clustering node, clustering data describing a clustering, and recording the clustering data in a relational clustering record; reading, from a hierarchical cluster node embodied in the hierarchical representation of data mining results, cluster data describing a cluster, and recording the cluster data in a relational cluster record; reading, from a hierarchical cluster attribute node embodied in the hierarchical representation of data mining results, cluster attribute data describing a cluster attribute, and recording the cluster attribute data in a relational cluster attribute record; reading, from a hierarchical cluster attribute bin node embodied in the hierarchical representation of data mining results, cluster attribute bin data describing a cluster attribute bin, and recording the cluster attribute bin data in a relational cluster attribute bin record.

Detailed Description Text (24):

Persons of skill in the art will recognize that reading a single attribute bin in the hierarchical format requires traversing all the records in the hierarchy above the attribute bin every time the attribute bin record is read. Persons skilled in the art will recognize that when the key fields for an attribute bin record are known, then that attribute bin record can be accessed directly in a single read

operation in a relational database. Persons skilled in the art will recognize that reading a particular attribute bin record from a relational format practically never requires traversing a hierarchy as such. Persons skilled in the art will recognize that the illustrative example pseudocode set forth just above implements a traversal of the entire hierarchical PMML structure in order to fill in all the relational records. Persons of skill in the art will recognize that one of the principal advantages of the present invention is that by use of its embodiments, it is typically necessary to traverse a hierarchical format only once, in order to convert it to relational format, and that after that single traversal, typical embodiments provide all the speed and ease of access of the relational model for analysis, extraction, querying, and reporting upon the results of data mining.

Current US Original Classification (1):

707/102

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMMC	Draw D
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☐ 5. Document ID: US 6477565 B1

L27: Entry 5 of 8

File: USPT

Nov 5, 2002

DOCUMENT-IDENTIFIER: US 6477565 B1

TITLE: Method and apparatus for restructuring of personalized data for transmission from a data network to connected and portable network appliances

Abstract Text (1):

A system for retrieving and disseminating information records from Internet sources includes a client device and an intermediary server system, including software, between the client device and the Internet. The system collects a record specific to a client from an individual one of said Internet sources in a first form in which the record is recorded at the Internet source, transforms the record from the first form to a second form specific to an application other than an Internet browser application, the application executable by the client device, and transmits the transformed record to the client device for display in the application other than an Internet browser application executable by the client device. In some cases the client device connects by a data link that is not Internet-compatible link.

Data mining on the Internet specific to clients and client devices is taught, with aggregation services and synchronization for keeping a client up-to-date efficiently for changing data content.

Detailed Description Text (22):

The method and apparatus of the present invention provides a unique capability of restructuring data in an intelligent way. That is, instead of simply converting one format of data into another, a first data set is analyzed and understood so that an alternate data set in a format specific to applications executable on a receiving device may be created that reflects the desired content and function of the first data set. More detail about how this is accomplished is provided below.

Current US Original Classification (1):

709/217

Current US Cross Reference Classification (1):

709/246

Current US Cross Reference Classification (2):

709/250

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 6. Document ID: US 6477538 B2

L27: Entry 6 of 8

File: USPT

Nov 5, 2002

DOCUMENT-IDENTIFIER: US 6477538 B2

TITLE: Data display apparatus and method for displaying data mining results as multi-dimensional data

Abstract Text (1):

A data display apparatus and method for displaying the result of a data mining process as multi-dimensional data. In one embodiment, the multi-dimensional data is displayed on a parallel coordinate axis. An engine unit executes the data mining process on displayed multi-dimensional data according to an instruction from a visual data mining tool and transfers the result to the visual data mining tool. The user interface unit of the visual data mining tool generates an axis corresponding to the result of the data mining process, adds the axis to the parallel coordinate axis and displays the result of the data mining process on the added axis.

Brief Summary Text (15):

Another form of a data display apparatus of the present invention comprises the following units: an input converting unit which receives the data mining analysis result on multi-dimensional data, and incorporates the analysis result into the multi-dimensional data to be displayed; and a display controlling unit which displays the analysis result on the display apparatus based on the output of the converting unit in the predetermined format of a graph.

Drawing Description Text (49):

FIGS. 48A and 48B are diagrams showing the process of converting the result of a decision tree analysis to range information on a graph.

Current US Original Classification (1):707/102Current US Cross Reference Classification (1):707/5

## CLAIMS:

11. A data display apparatus for displaying multi-dimensional data on a graph in a predetermined graphical format having a coordinate axis system, comprising: input converting means for receiving an analysis result from automatically executing a data mining process on the multi-dimensional data and incorporating the analysis result into the multi-dimensional data to be displayed; and display controlling means for displaying the analysis result on the display apparatus on the same graph displaying the multi-dimensional data, based on the output of said input converting means, wherein the graphical format used to display the multi-dimensional data is the same as the graphical format used to display the data mining result.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 7. Document ID: US 6473741 B1

L27: Entry 7 of 8

File: USPT

Oct 29, 2002

DOCUMENT-IDENTIFIER: US 6473741 B1

TITLE: Method and system for aggregation and exchange of electronic tax information

Abstract Text (1):

A process that arranges information warehoused at individual accounting and tax preparation firms at a central location for the purpose of marketing information. Data contained at these firms have qualitative and quantitative characteristics that are different from data archived at the Internal Revenue Service or other tax authorities. This fact makes the data valuable as data in two ways. First the data can be exchanged to provide new revenue streams. Secondly, these data, if grouped into data warehouses of other firms, has value as pure data, not just customer lists. These data may be sold or rented creating additional revenue streams for their originators. The purchasers of this bulk data are interested in using this data in the field of data mining. Data mining is a technique of analyzing vast amounts of information to uncover relationships to predict events and has wide application in many areas of the economy.

Detailed Description Text (36):

First, a service bureau 20 can provide no cost or very low cost off site archival of data. Backing up firm 10 data is a critical function that is frequently overlooked by smaller accounting and tax preparation firms. Secondly, a service bureau 20 can provide no cost or very low cost transmission of electronically filed income tax returns. Currently, most firms 10 pay a user fee to their software vendor for this service. Then, data is stored in detail with associated identifying characteristics of the taxpayers such as name, social security numbers, and addresses. These data are to be stored on a separate system 30 that protects the confidentiality of each taxpayer and may only be released with proper authorization procedures and controls. These data are also converted to an electronic format suitable for retrieval by users requesting information such as a mortgage lender. The format will enable mortgage lenders to directly download the complete tax return into their analysis software and/or credit scoring software.

Current US Cross Reference Classification (3):707/3

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 8. Document ID: US 6470352 B2

L27: Entry 8 of 8

File: USPT

Oct 22, 2002

DOCUMENT-IDENTIFIER: US 6470352 B2

TITLE: Data display apparatus and method for displaying data mining results as multi-dimensional data

Abstract Text (1):

A data display apparatus and method for displaying the result of a data mining process as multi-dimensional data. In one embodiment, the multi-dimensional data is displayed on a parallel coordinate axis. An engine unit executes the data mining process on displayed multi-dimensional data according to an instruction from a visual data mining tool and transfers the result to the visual data mining tool. The user interface unit of the visual data mining tool generates an axis corresponding to the result of the data mining process, adds the axis to the parallel coordinate axis and displays the result of the data mining process on the added axis.

Brief Summary Text (15):

Another form of a data display apparatus of the present invention comprises the following units: an input converting unit which receives the data mining analysis result on multi-dimensional data, and incorporates the analysis result into the multi-dimensional data to be displayed; and a display controlling unit which displays the analysis result on the display apparatus based on the output of the converting unit in the predetermined format of a graph.

Drawing Description Text (49):

FIGS. 48A and 48B are diagrams showing the process of converting the result of a decision tree analysis to range information on a graph.

Current US Original Classification (1):

707/102

Current US Cross Reference Classification (1):

707/5

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. Desc.
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